TEJUS
CONSULTANTS

No.TC/BBMP/YNK -PMC/805/22-23

Date: 25 –04 –2023

To
The Executive Engineer
Project Division,
Yelahanka Zone, Bangalore

Dear Sir

Sub: **Improvements to widen portion of roads,construction of New drains,UG cable duct and Footpath at Doddabommasandra main road surrounding road in Ward No.10**

In reference to the above subject, this is to bring to your kind notice that we have scrutinized the **Second And Final Bill** submitted by **Sri. Gopikrishna Apsani ( Nidhi Constructions)** towards the above said work and arrived at an amount of **Rs. 1,49,95,624.01/- (Rupees One Crore Forty Nine Lakh Ninety Five Thousand Six Hundred Twenty Four And One Paise Only)** the work has been completed satisfactorily.

This is for your kind information.

Thank you and assuring you the best of our Services at all the times

TEJUS CONSULTANTS

For Tejus Consultants
(Nischal M)

Asst. Executive Engineer
Project Division
Yelahanka Zone
BBMP, Bangalore - 92

TEJUS CONSULTANTS
No. 45, Present BBMP No. 1204/45, Old no. 1204, 1st main, MRCR Layout, Bangalore 560040, Ph : 9611192254, 9611644110, tejusconsultants@gmail.com

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## GRADATION FOR GSB
## (As per MORT&H 400-1,Grading-II)

| | | |
|---|---|---|
| Name of Work | : | Improvements to widen portion of roads,construction of New drains,UG cable duct and Footpath at Doddabommasandra main road surrounding road in Ward No.10 |
| Client | : | BRUHAT BANGALORE MAHANAGARA PALIKE |
| Consultant | : | M/s Tejus Consultants |
| Contractor | : | Sri. Gopikrishna Apsani ( Nidhi Constructions) |
| Date of Testing | : | 04-02-2023 |
| Type of Mix | : | GSB |
| Sample I/D | : | GSB1 |

| | | | | |
|---|---|---|---|---|
| Sample Location: | Telicom Layout Cross Roads | Date of Sampling: | 03-02-2023 | |
| | | Date of testing: | 04-02-2023 | |
| Type of material & Purpose: | GSB | Oven Dry Wt.(gms): | 10000.0 | |

| IS Sieve size in mm | Weight retained | Cummulative weight retained (gm) | Cummulative % of retained | Cummulative % of passing | Specification limits |
|---|---|---|---|---|---|
| 75 | 0 | 0 | 0.00 | 100.00 | - |
| 53 | 0 | 0 | 0.00 | 100.00 | 100.00 |
| 26.5 | 2322 | 2322 | 23.22 | 76.78 | 70-100 |
| 9.5 | 2965 | 4687 | 46.87 | 53.13 | 50-80 |
| 4.75 | 922 | 5609 | 56.09 | 43.91 | 40-65 |
| 2.36 | 722 | 6331 | 63.31 | 36.69 | 30-50 |
| 0.425 | 2352 | 8683 | 86.83 | 13.17 | 10-15 |
| 0.075 | 834 | 9517 | 95.17 | 4.83 | <5 |
| Pan | 483.0 | | | | |
| Total | 10000.0 | | | | |

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3. Any Query regarding the report must be reported reported within 15days from the date of testing.
4.The material used in the site satisfied the standard of MORTH's 5th revision and hence can be used in the work.

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| | |
|---|---|
| Project | Improvements to widen portion of roads,construction of New drains,UG cable duct and Footpath at Doddabommasandra main road surrounding road in Ward No.10 |
| Client | BRUHAT BANGALORE MAHANAGARA PALIKE |
| Consultant | M/s Tejus Consultants, Bangalore |
| Contractor | Sri. Gopikrishna Apsani ( Nidhi Constructions) |

**Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28))**

| | | | |
|---|---|---|---|
| Date of Testing | 10-02-2023 | | |
| Layer no. or level | GSB layer | | |
| Depth of hole | 200mm | | |
| Field density: | 1 | 2 | 2 |
| Chainage | Telicom Layout 4th Cross Road'@153 | 2nd Main Road Telicom Layout'@208 | 2nd Main Road Telicom Layout'@374 |
| Wt. of wet material from hole (Ww) gms. | 5899 | 5963 | 5892 |
| Wt. of sand+cylinder before pouring (w1) gms. | 15000 | 15000 | 15000 |
| Wt. of sand+cylinder after pouring (w2) gms. | 10612 | 10574 | 10621 |
| Wt. of sand in hole+ cone (w3) gms. | 4388 | 4426 | 4379 |
| Wt. of cone gms. | 1080 | 1080 | 1080 |
| Wt. of sand gms. | 3308 | 3346 | 3299 |
| Bulk density of sand (γs)gm/cc | 1.32 | 1.32 | 1.32 |
| Bulk density of material(i.e. wt. of the wet material) γb)=(Ww/w4*(γs))gm/cc | 2.35 | 2.35 | 2.36 |
| | | | |
| Moisture meter reading(moisture content) | 6.50 | 6.40 | 6.40 |
| | | | |
| Result | | | |
| DD(Wt.of the dry material)=(100γb/100+mc)gm/cc | 2.21 | 2.21 | 2.22 |
| MDD | 2.25 | 2.25 | 2.25 |
| OMC | 6.30% | 6.30% | 6.30% |
| % compaction obtained | 98.23 | 98.26 | 98.48 |
| % compaction required | 98% | 98% | 98% |

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Improvements to widen portion of roads,construction of New drains,UG cable duct and Footpath at Vaddarapalya,Sahakarnagar,Bangalore-92 main road surrounding road in Ward No.10

Name: Bruhat Bengaluru Mahanagara Palike

Client: TEJUS CONSULTANTS, BANGALORE

Contractor: Sri. Gopikrishna Ajmani ( Nidhi Constructions)

## AGGREGATE IMPACT VALUE (IS: 2386 Part - 4)

| | | | |
|---|---|---|---|
| Material Use | WMM | Date of Sampling | 10-02-2023 |
| Location | Infosys Layout Cross Roads | Date of Testing | 11-02-2023 |

| Description | | Test No. | | | Spec Limit (%) |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | |
| Wt. of saturated surface dry (ssd) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm) | (Wa) | 365.00 | 352.00 | 346.00 | |
| Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm) | (Wb) | 281.00 | 268.00 | 268.00 | |
| Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm) | (We) | 84.00 | 84.00 | 78.00 | |
| Aggregate Impact Value (%) | (We/Wa)*100 | 23.01 | 23.86 | 22.54 | |
| Average Aggregate impact value | (%) | 23.14 | | | Max - 30 % |

Remarks : ✓ Satisfactory / Not Satisfactory

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| | |
|---|---|
| **Project** | *Improvements to widen portion of roads,construction of New drains,UG cable duct and Footpath at Doddabommasandra main road surrounding road in Ward No.10* |
| **Client** | Bruhat Bengaluru Mahanagara Palike |
| **Consultant** | TEJUS CONSULTANTS, BANGALORE |
| **Contractor** | Sri. Gopikrishna Apsani ( Nidhi Constructions) |

**FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)**

| | | | |
|---|---|---|---|
| **Type of Material** | WMM | **Proposed Use** | **WMM** |
| **Sample Location** | Telicom Layout Cross Roads | **Date of Sampling** | **10-02-2023** |
| | | **Date of Testing** | **11-02-2023** |

| **Size of aggregate** | | **Flakiness Index** | | **Elongation Index** | |
|---|---|---|---|---|---|
| **Passing through IS sieve, mm** | **Retained on IS sieve, mm** | **Total wt. of aggregate retained on sieves (A) gms.** | **Wt. of aggregate passing from Flakiness gauge (B) gms** | **Wt. of aggregate retained on Flakiness gauge (C) gms** | **Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms** |
| 63.0 | 50.0 | 0 | 0 | 0 | 0 |
| 50.0 | 40.0 | 0 | 0 | 0 | 0 |
| 40.0 | 31.5 | 0 | 0 | 0 | 0 |
| 31.5 | 25.0 | 0 | 0 | 0 | 0 |
| 25.0 | 20.0 | 0 | 0 | 0 | 0 |
| 20.0 | 16.0 | 364 | 73 | 543 | 76 |
| 16.0 | 12.5 | 1146 | 114 | 946 | 112 |
| 12.5 | 10.0 | 768 | 54 | 752 | 52 |
| 10.0 | 6.3 | 611 | 58 | 550 | 47 |
| **Total** | | **2889** | **299** | **2791** | **287** |

**Note:** Minimum 200 Pcs should be taken on each fraction of test

| | |
|---|---|
| Flakiness Index(%): | 10.35 |
| Elongation Index(%): | 10.28 |
| Combined FI+EL (%) | 20.63 |

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|---|---|---|
| **Name of Work** | : | Improvements to widen portion of roads,construction of New drains,UG cable duct and Footpath at Doddabommasandra main road surrounding road in Ward No.10 |
| **Client** | : | Bruhat Bengaluru Mahanagara Palike |
| **Consultant** | : | TEJUS CONSULTANTS, BANGALORE |
| **Contractor** | : | Sri. Gopikrishna Apsani ( Nidhi Constructions) |
| **Date of Testing** | : | 11-02-2023 |
| **Type of Mix** | : | WMM |
| **Sample I/D** | : | WMM 1 |

## GRADATION FOR WMM
## (As per MORT&H 400-11)

| | | | |
|---|---|---|---|
| **Sample Location:** | Telicom Layout Cross Roads | **Date of Sampling:** | 10-02-2023 |
| | | **Date of testing:** | 11-02-2023 |
| **Type of material & Purpose:** | WMM | **Oven Dry Wt.(gms):** | 10000.0 |

| IS Sieve size in mm | Weight retained | Cummulative weight retained (gm) | Cummulative % of retained | Cummulative % of passing | Specification limits |
|---|---|---|---|---|---|
| 53 | 0 | 0 | 0.00 | 100.00 | 100.00 |
| 45 | 368 | 368 | 3.68 | 96.32 | 95-100 |
| 22.4 | 1955 | 2323 | 23.23 | 76.77 | 60-80 |
| 11.2 | 2643 | 4966 | 49.66 | 50.34 | 40-60 |
| 4.75 | 2025.0 | 6991 | 69.91 | 30.09 | 25-40 |
| 2.36 | 1258.0 | 8249 | 82.49 | 17.51 | 15-30 |
| 0.6 | 552.0 | 8801 | 88.01 | 11.99 | 8.0-22.0 |
| 0.075 | 715.0 | 9516 | 95.16 | 4.84 | 0-8 |
| Pan | 484.0 | 10000 | | | |
| Total | 10000.0 | | | | |

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| | |
|---|---|
| **Project** | Improvements to widen portion of roads,construction of New drains,UG cable duct and Footpath at Doddabommasandra main road surrounding road in Ward No.10 |
| **Client** | Bruhat Bengaluru Mahanagara Palike |
| **Consultant** | TEJUS CONSULTANTS, BANGALORE |
| **Contractor** | Sri. Gopikrishna Apsani ( Nidhi Constructions) |

**Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)**

| | | |
|---|---|---|
| | **Date:** | **16-02-2023** |
| **Layer no. or level** | WMM I layer | |
| **Depth of hole** | 230mm | |
| **Field density:** | **1** | **2** |
| **Chainage** | **Telicom Layout 4th Cross Road '@155.00** | **2nd Main Road Telicom Layout '@246.00** |
| Wt. of wet material from hole (Ww) gms. | 5986 | 5876 |
| Wt. of sand+cylinder before pouring (w1) gms. | 15000 | 15000 |
| Wt. of sand+cylinder after pouring (w2) gms. | 10595 | 10648 |
| Wt. of sand in hole+ cone (w3) gms. | 4405 | 4352 |
| Wt. of cone gms. | 1080 | 1080 |
| Wt. of sand gms. | 3325 | 3272 |
| Bulk density of sand (γs)gm/cc | 1.32 | 1.32 |
| Bulk density of material(i.e. wt. of the wet material) (γb)=(Ww/w4*(γs))gm/cc | 2.38 | 2.37 |
| | | |
| Moisture meter reading(moisture content) | 6.40 | 6.20 |
| **Result** | | |
| FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc | 2.23 | 2.23 |
| MDD | 2.27 | 2.27 |
| OMC | 6.10% | 6.10% |
| % compaction obtained | 98.39 | 98.33 |
| % compaction required | 98% | 98% |

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| | |
|---|---|
| Project: | Improvement to wider portion of roads/construction of Non slum UG cable duct and Footpath at Doddabommasandra from NSC surveying road to Ward No.16 |
| Client: | Bruhat Bengaluru Mahanagara Palike |
| Reference: | TE/KA/CONS/LT/BNP/21/0001 |
| Reference: | Nil (Supplied by Agency) Nil (Internal) |

**TEST REPORT FOR FLAKINESS AND ELONGATION INDEX OF COARSE AGGREGATE (AS PER IS 2386, PART I)**

| | | | |
|---|---|---|---|
| Type of Material: | Metal | Proposed Use: | DBM |
| Source/ Location: | As given | Date of Sampling: | 13.01.2023 |
| | | Date of Testing: | 13.01.2023 |

| Size of aggregate | | Flakiness Index | | Elongation Index | |
|---|---|---|---|---|---|
| Passing through IS sieve, mm | Retained on IS sieve, mm | Total wt. of aggregate retained on sieves (A) gms. | Wt. of aggregate passing from Flakiness gauge (B) gms | Wt. of aggregate retained on Flakiness gauge (C) gms | Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms |
| 450 | 300 | 0 | 0 | 0 | 0 |
| 300 | 400 | 0 | 0 | 0 | 0 |
| 400 | 315 | 1001 | 675 | 7134 | 642 |
| 315 | 250 | 4013 | 256 | 3304 | 254 |
| 250 | 200 | 2562 | 109 | 1833 | 234 |
| 200 | 160 | 1624 | 421 | 953 | 309 |
| 160 | 125 | 567 | 158 | 523 | 168 |
| 125 | 100 | 435 | 72 | 321 | 93 |
| 100 | 63 | 218 | 68 | 84 | 63 |
| Total | | 16981 | 1820 | 14442 | 1459 |
| | | | | | |

Results

| | | |
|---|---|---|
| | Flakiness Index(%): | 10.72 |
| | Elongation Index(%): | 10.10 |
| | Combined FI+EI. (%) | 20.82 |

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4. The material used in the site satisfied the standard of MORTH's 5th revision and hence 2nd Bill raised in the work.

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BBMP, Bangalore - 92



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| | |
|---|---|
| Project | Improvements to widen portion of roads,construction of New drains,UG cable duct and Footpath at Doddaboommasandra main road surrounding road in Ward No.10 |
| Client | Bruhat Bengaluru Mahanagara Palike |
| Consultant | TEJUS CONSULTANTS, BANGALORE |
| Contractor | Sri. Gopikrishna Apsani ( Nidhi Constructions) |

## AGGREGATE IMPACT VALUE (IS: 2386 Part - 4)

| | | | |
|---|---|---|---|
| Proposed Use | DBM | Date of Sampling | 13-03-2023 |
| Sample Location | At plant | Date of Testing | 13-03-2023 |

| Sl. No. | Description | | Test No. 1 | Test No. 2 | Test No. 3 | Spec Limit (%) |
|---|---|---|---|---|---|---|
| 1 | Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm) | (Wa) | 386.00 | 379.00 | 374.00 | |
| 2 | Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm) | (Wb) | 297.00 | 295.00 | 281.00 | |
| 3 | Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm) | (Wc) | 89.00 | 84.00 | 93.00 | |
| 4 | Aggregate Impact Value (%) | (Wc/Wa)*100 | 23.06 | 22.16 | 24.87 | |
| 5 | Average Aggregate impact value | (%) | 23.36 | | | Max - 30 % |

Remarks : Satisfactory / Not Satisfactory

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## DETERMINATION OF RATE OF SPREAD TACK COAT

| | |
|---|---|
| **Name of Work :** | Improvements to widen portion of roads,construction of New drains,UG cable duct and Footpath at Doddabommasandra main road surrounding road in Ward No.10 |
| **Client :** | BRUHAT BANGALORE MAHANAGARA PALIKE |
| **Consultant :** | TEJUS CONSULTANTS, BANGALORE |
| **Contractor :** | Sri. Gopikrishna Apsani ( Nidhi Constructions) |
| **Date of Testing :** | 14-03-2023 |
| **Type of Mix :** | Tack coat |
| **Sample I/D :** | 1 |
| **Location :** | Krishna Temple Road |

| **Determination** | **Unit** | **Test No** | | |
|---|---|---|---|---|
| | | **1** | **2** | **3** |
| **Location** | **Chainage** | **@39** | **@97** | **@128** |
| Size of Plate (mxm) | Mt | 0.30 x .30 | 0.30 x .30 | 0.30 x .30 |
| Area of Plate (a) | Sq.mtr | 0.09 | 0.09 | 0.09 |
| Initial Wt of empty Plate (b) | Kg | 0.758 | 0.783 | 0.845 |
| Final weight of plate after application of tack Coat (c) | Kg | 0.781 | 0.806 | 0.868 |
| Weight of tack Coat (d=c-b) | Kg | 0.023 | 0.023 | 0.023 |
| Rate of spread of tack coat | Kg/sq.m | 0.253 | 0.253 | 0.253 |
| Average | Kg/sq.m | 0.253 | | |
| Specified Limit | Kg/sq.m | **0.250 Kg/sq.m** | | |

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| BITUMEN CONTENT AND GRADATION DETERMINATION OF DENSE BITUMINOUS MACADAM MIX | | |
|---|---|---|
| **Name of Work** | : | Improvements to widen portion of roads,construction of New drains,UG cable duct and Footpath at Doddabommasandra main road surrounding road in Ward No.10 |
| **Client** | : | Bruhat Bengaluru Mahanagara Palike |
| **Consultant** | : | TEJUS CONSULTANTS, BANGALORE |
| **Contractor** | : | Sri. Gopikrishna Apsani ( Nidhi Constructions) |
| **Date of Testing** | : | 14-03-2023 |
| **Type of Mix** | : | DBM |
| **Sample I/D** | : | DBM-1 |

| DETERMINATION OF BITUMEN CONTENT | | |
|---|---|---|
| Description | Trail 1 | Trail 2 |
| 1. Weight of Mixture before extraction, g | 879 | 911 |
| 2. Weight of Mixture after extraction, g | 841 | 872 |
| 3. Weight of Bitumen | 38 | 39 |
| 4. Weight of filter paper before extraction, g | 2.00 | 2.00 |
| 5. Weight of filter paper after extraction, g | 4.00 | 4.00 |
| 6. Weight of fines, g | 2.00 | 2.00 |
| 7. Weight of Bitumen & fines | 40.00 | 41.00 |
| 8. Bitumen content in % | 4.55 | 4.50 |
| 9. Average Bitumen content in % | 4.53 | |
| 10. Minimum Bitumen content in % | 4.50 | |

GRADATION FOR DBM AFTER EXTRACTION

(As per MORT&H 500-10,Grading-2)

| | | | |
|---|---|---|---|
| **Sample Location:** | Krishna Temple Road | **Date of Sampling:** | 14-03-2023 |
| | | **Date of testing:** | 14-03-2023 |
| **Type of material & Purpose:** | DBM | **Oven Dry Wt.(gms):** | 841 |

| IS Sieve size in mm | Weight retained | Cummulative weight retained (gm) | Cummulative % of retained | Cummulative % of passing | Specification limits |
|---|---|---|---|---|---|
| 37.50 | 0.0 | 0.0 | 0.00 | 100.00 | 100.00 |
| 26.50 | 51.0 | 51.0 | 6.06 | 93.94 | 90-100 |
| 19.00 | 146.0 | 197.0 | 23.42 | 76.58 | 71-95 |
| 13.20 | 127.0 | 324.0 | 38.53 | 61.47 | 56-80 |
| 4.750 | 163.0 | 487.0 | 57.91 | 42.09 | 38-54 |
| 2.360 | 98.0 | 585.0 | 69.56 | 30.44 | 28-42 |
| 0.300 | 168.0 | 753.0 | 89.54 | 10.46 | 7-21 |
| 0.075 | 44.0 | 797.0 | 94.77 | 5.23 | 2-8 |
| Pan | 44.0 | 841.0 | | | |
| Total | 841.0 | | | | |

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## FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

| | |
|---|---|
| **Project :** | Improvements to widen portion of roads,construction of New drains,UG cable duct and Footpath at Doddabommasandra main road surrounding road in Ward No.10 |
| **Client :** | BRUHAT BANGALORE MAHANAGARA PALIKE |
| **Consultant :** | TEJUS CONSULTANTS, BANGALORE |
| **Contractor:** | Sri. Gopikrishna Apsani ( Nidhi Constructions) |

| | | | |
|---|---|---|---|
| **Type of Material** | BC | **Proposed Use** | BC |
| **Sample Location** | At plant | **Date of Sampling** | 15-03-2023 |
| | | **Date of Testing** | 15-03-2023 |

| **Size of aggregate** | | **Flakiness Index** | | **Elongation Index** | |
|---|---|---|---|---|---|
| **Passing through IS sieve, mm** | **Retained on IS sieve, mm** | **Total wt. of aggregate retained on sieves (A) gms.** | **Wt. of aggregate passing from Flakiness gauge (B) gms** | **Wt. of aggregate retained on Flakiness gauge (C) gms** | **Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms** |
| 63.0 | 50.0 | 0 | 0 | 0 | 0 |
| 50.0 | 40.0 | 0 | 0 | 0 | 0 |
| 40.0 | 31.5 | 0 | 0 | 0 | 0 |
| 31.5 | 25.0 | 0 | 0 | 0 | 0 |
| 25.0 | 20.0 | 0 | 0 | 0 | 0 |
| 20.0 | 16.0 | 835 | 95 | 956 | 75 |
| 16.0 | 12.5 | 1485 | 182 | 1625 | 156 |
| 12.5 | 10.0 | 563 | 75 | 732 | 83 |
| 10.0 | 6.3 | 452 | 36 | 685 | 54 |
| **Total** | | **3335** | **388** | **3998** | **368** |

**Note:** Minimum 200 Pcs should be taken on each fraction of test

| | |
|---|---|
| Flakiness Index(%): | 11.63 |
| Elongation Index(%): | 9.20 |
| Combined FI+EL (%) | 20.84 |

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3. Any Query regarding the report must be reported reported within 15days from the date of testing.
4.The material used in the site satisfied the standard of MORTH's 5th revision and hence can be used in the work.

TEJUS CONSULTANTS

Authorised Signatory

Asst. Executive Engineer
Project Division
Yelahanka Zone
BBMP, Bangalore - 92



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## AGGREGATE IMPACT VALUE
## (IS: 2386 Part - 4)

| | | | |
|---|---|---|---|
| oject | Improvements to widen portion of roads,construction of New drains,UG cable duct and Footpath at Doddabommasandra main road surrounding road in Ward No.10 | | |
| ent | BRUHAT BANGALORE MAHANAGARA PALIKE | | |
| nsultant | TEJUS CONSULTANTS, BANGALORE | | |
| ntractor | Sri. Gopikrishna Apsani ( Nidhi Constructions) | | |
| posed | BC | **Date of Sampling** | 15-03-2023 |
| mple cation | At plant | **Date of Testing** | 15-03-2023 |

| No. | Description | | Test No. 1 | Test No. 2 | Test No. 3 | Spec Limit (%) |
|---|---|---|---|---|---|---|
| | Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm) | (Wa) | 358.00 | 327.00 | 365.00 | |
| 2 | Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm) | (Wb) | 276.00 | 253.00 | 277.00 | |
| 3 | Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm) | (Wc) | 82.00 | 74.00 | 88.00 | |
| 4 | Aggregate Impact Value (%) | (Wc/Wa)*100 | 22.91 | 22.63 | 24.11 | |
| 5 | Average Aggregate impact value | (%) | 23.21 | | | Max - 30 % |

marks : Satisfactory / Not Satisfactory

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ny Query regarding the report must be reported reported within 15days from the date of testing.
he material used in the site satisfied the standard of MORTH's 5th revision and hence can be used
he work.

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Authorised Signatory

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Yelahanka Zone

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| | |
|---|---|
| | Improvements to widen portion of roads,construction of New drains,UG cable duct and Footpath at Doddabommasandra main road surrounding road in Ward No.10 |
| | Bruhat Bengaluru Mahanagara Palike |
| ant | TEJUS CONSULTANTS, BANGALORE |
| ctor | Sri. Gopikrishna Apsani ( Nidhi Constructions) |

## AGGREGATE IMPACT VALUE (IS: 2386 Part - 4)

| | | | |
|---|---|---|---|
| d Use | DBM | Date of Sampling | 15-03-2023 |
| n | At plant | Date of Testing | 15-03-2023 |

| Description | | Test No. | | | Spec Limit (%) |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | |
| Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm) | (Wa) | 385.00 | 362.00 | 371.00 | |
| Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm) | (Wb) | 295.00 | 281.00 | 282.00 | |
| Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm) | (Wc) | 90.00 | 81.00 | 89.00 | |
| Aggregate Impact Value (%) | (Wc/Wa)*100 | 23.38 | 22.38 | 23.99 | |
| Average Aggregate impact value | (%) | 23.25 | | | Max - 30 % |

ks :

Satisfactory / Not Satisfactory

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material used in the site satisfied the standard of MORTH's 5th revision and hence can be used
work.

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Project Division
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| | |
|---|---|
| Project | Improvements to widen portion of roads,construction of New drains,UG cable duct and Footpath at Doddabommasandra main road surrounding road in Ward No.10 |
| Client | Bruhat Bengaluru Mahanagara Palike |
| Consultant | TEJUS CONSULTANTS, BANGALORE |
| Contractor | Sri. Gopikrishna Apsani ( Nidhi Constructions) |

## FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

| | | | | |
|---|---|---|---|---|
| Type of Material | DBM | | Proposed Use | DBM |
| Sample Location | At plant | | Date of Sampling | 15-03-2023 |
| | | | Date of Testing | 15-03-2023 |

| Size of aggregate | | Flakiness Index | | Elongation Index | |
|---|---|---|---|---|---|
| Passing through IS sieve, mm | Retained on IS sieve, mm | Total wt. of aggregate retained on sieves (A) gms. | Wt. of aggregate passing from Flakiness gauge (B) gms | Wt. of aggregate retained on Flakiness gauge (C) gms | Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms |
| 63.0 | 50.0 | 0 | 0 | 0 | 0 |
| 50.0 | 40.0 | 0 | 0 | 0 | 0 |
| 40.0 | 31.5 | 7233 | 633 | 7033 | 386 |
| 31.5 | 25.0 | 4236 | 246 | 3525 | 291 |
| 25.0 | 20.0 | 2425 | 265 | 1992 | 226 |
| 20.0 | 16.0 | 1535 | 315 | 952 | 255 |
| 16.0 | 12.5 | 455 | 123 | 456 | 146 |
| 12.5 | 10.0 | 433 | 58 | 252 | 98 |
| 10.0 | 6.3 | 125 | 61 | 90 | 69 |
| **Total** | | **16442** | **1701** | **14300** | **1471** |

Results

| | |
|---|---|
| Flakiness Index(%): | 10.35 |
| Elongation Index(%): | 10.29 |
| Combined FI+EL (%) | 20.63 |

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4.The material used in the site satisfied the standard of MORTH's 5th revision and hence can be used in the work.

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## BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

| | |
|---|---|
| **Name of Work :** | Improvements to widen portion of roads,construction of New drains,UG cable duct and Footpath at Doddabommasandra main road surrounding road in Ward No.10 |
| **Client :** | BRUHAT BANGALORE MAHANAGARA PALIKE |
| **Consultant :** | TEJUS CONSULTANTS, BANGALORE |
| **Contractor :** | Sri. Gopikrishna Apsani ( Nidhi Constructions) |
| **Date of Testing :** | 17-03-2023 |
| **Type of Mix :** | BC |
| **Sample I/D :** | BC2 |

### DETERMINATION OF BITUMEN CONTENT

| Description | Trail 1 | Trail 2 |
|---|---|---|
| 1. Weight of Mixture before extraction, g | 894 | 933 |
| 2. Weight of Mixture after extraction, g | 847 | 884 |
| 3. Weight of Bitumen | 47 | 49 |
| 4. Weight of filter paper before extraction, g | 2.00 | 2.00 |
| 5. Weight of filter paper after extraction, g | 4.00 | 4.00 |
| 6. Weight of fines, g | 1.60 | 2.00 |
| 7. Weight of Bitumen & fines | 48.60 | 51.00 |
| 8. Bitumen content in % | 5.44 | 5.47 |
| 9. Average Bitumen content in % | 5.45 | |
| 10. Minimum Bitumen content in % | 5.40 | |

### GRADATION FOR BC AFTER EXTRACTION
(As per MORT&H 500-17,Grading-2)

| | | | | | |
|---|---|---|---|---|---|
| Sample Location: | Renukamba Temple Road | | Date of Sampling: | 17-03-2023 | |
| Type of material & Purpose: | BC | | Date of testing: | 17-03-2023 | |
| | | | Oven Dry Wt.(gms): | 847.0 | |
| IS Sieve size in mm | Weight retained | Cummulative weight retained (gm) | Cummulative % of retained | Cummulative % of passing | Specification limits |
| 19.00 | 0 | 0 | 0.00 | 100.00 | 100.00 |
| 13.20 | 73 | 73.0 | 8.62 | 91.38 | 90 - 100 |
| 9.50 | 131 | 204.0 | 24.09 | 75.91 | 70 - 88 |
| 4.75 | 126 | 330.0 | 38.96 | 61.04 | 53 - 71 |
| 2.360 | 112 | 442.0 | 52.18 | 47.82 | 42 - 58 |
| 1.180 | 83 | 525.0 | 61.98 | 38.02 | 34 - 48 |
| 0.600 | 62 | 587.0 | 69.30 | 30.70 | 26 - 38 |
| 0.300 | 84 | 671.0 | 79.22 | 20.78 | 18 - 28 |
| 0.150 | 38 | 709.0 | 83.71 | 16.29 | 12 - 20 |
| 0.075 | 94 | 803.0 | 94.81 | 5.19 | 4 - 10 |
| Pan | 44.0 | | | | |
| Total | 847.0 | | | | |

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4.The material used in the site satisfied the standard of MORTH's 5th revision and hence can be used in the work.

Asst. Executive Engineer
Project Division
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## DETERMINATION OF RATE OF SPREAD TACK COAT

| | |
|---|---|
| me of Work : | Improvements to widen portion of roads,construction of New drains,UG cable duct and Footpath at Doddabommasandra main road surrounding road in Ward No.10 |
| ent : | BRUHAT BANGALORE MAHANAGARA PALIKE |
| nsultant : | TEJUS CONSULTANTS, BANGALORE |
| ntractor : | Sri. Gopikrishna Apsani ( Nidhi Constructions) |
| te of Testing : | 17-03-2023 |
| pe of Mix : | Tack coat |
| mple I/D : | 1 |
| cation | 11 th Main Yarappa Garden |

| Determination | Unit | Test No | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| Location | Chainage | @75 | @131 | @213 |
| e of Plate (mxm) | Mt | 0.30 x .30 | 0.30 x .30 | 0.30 x .30 |
| ea of Plate (a) | Sq.mtr | 0.09 | 0.09 | 0.09 |
| tial Wt of empty Plate (b) | Kg | 0.779 | 0.812 | 0.785 |
| nal weight of plate after application of k Coat (c) | Kg | 0.802 | 0.835 | 0.808 |
| eight of tack Coat (d=c-b) | Kg | 0.023 | 0.023 | 0.023 |
| te of spread of tack coat | Kg/sq.m | 0.251 | 0.251 | 0.251 |
| erage | Kg/sq.m | 0.251 | | |
| ecified Limit | Kg/sq.m | **0.250 Kg/sq.m** | | |

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## DETERMINATION OF RATE OF SPREAD TACK COAT

| | |
|---|---|
| me of Work : | Improvements to widen portion of roads,construction of New drains,UG cable duct and Footpath at Doddabommasandra main road surrounding road in Ward No.10 |
| ient : | BRUHAT BANGALORE MAHANAGARA PALIKE |
| nsultant : | TEJUS CONSULTANTS, BANGALORE |
| ntractor : | Sri. Gopikrishna Apsani ( Nidhi Constructions) |
| te of Testing : | 17-03-2023 |
| pe of Mix : | Tack coat |
| mple I/D : | 2 |
| cation | Renukamba Temple Road |

| Determination | Unit | Test No | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| Location | Chainage | @36 | @87 | @110 |
| e of Plate (mxm) | Mt | 0.30 x .30 | 0.30 x .30 | 0.30 x .30 |
| ea of Plate (a) | Sq.mtr | 0.09 | 0.09 | 0.09 |
| tial Wt of empty Plate (b) | Kg | 0.812 | 0.784 | 0.798 |
| al weight of plate after application of k Coat (c) | Kg | 0.835 | 0.807 | 0.821 |
| ight of tack Coat (d=c-b) | Kg | 0.023 | 0.023 | 0.023 |
| te of spread of tack coat | Kg/sq.m | 0.251 | 0.252 | 0.252 |
| erage | Kg/sq.m | 0.252 | | |
| ecified Limit | Kg/sq.m | **0.250 Kg/sq.m** | | |

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# BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

| | |
|---|---|
| **Name of Work :** | Improvements to widen portion of roads,construction of New drains,UG cable duct and Footpath at Doddabommasandra main road surrounding road in Ward No.10 |
| **Client :** | BRUHAT BANGALORE MAHANAGARA PALIKE |
| **Consultant :** | TEJUS CONSULTANTS, BANGALORE |
| **Contractor :** | Sri. Gopikrishna Apsani ( Nidhi Constructions) |
| **Date of Testing :** | 17-03-2023 |
| **Type of Mix :** | BC |
| **Sample I/D :** | BC1 |

## DETERMINATION OF BITUMEN CONTENT

| Description | Trail 1 | Trail 2 |
|---|---|---|
| 1. Weight of Mixture before extraction, g | 953 | 945 |
| 2. Weight of Mixture after extraction, g | 903 | 896 |
| 3. Weight of Bitumen | 50 | 49 |
| 4. Weight of filter paper before extraction, g | 2.00 | 2.00 |
| 5. Weight of filter paper after extraction, g | 4.00 | 4.00 |
| 6. Weight of fines, g | 1.60 | 2.00 |
| 7. Weight of Bitumen & fines | 51.60 | 51.00 |
| 8. Bitumen content in % | 5.41 | 5.40 |
| 9. Average Bitumen content in % | **5.41** | |
| 10. Minimum Bitumen content in % | **5.40** | |

## GRADATION FOR BC AFTER EXTRACTION

(As per MORT&H 500-17,Grading-2)

| | | | |
|---|---|---|---|
| Sample Location: | 11 th Main Yarappa Garden | Date of Sampling: | 17-03-2023 |
| Type of material & Purpose: | BC | Date of testing: | 17-03-2023 |
| | | Oven Dry Wt.(gms): | 903.0 |

| IS Sieve size in mm | Weight retained | Cummulative weight retained (gm) | Cummulative % of retained | Cummulative % of passing | Specification limits |
|---|---|---|---|---|---|
| 19.00 | 0 | 0 | 0.00 | 100.00 | 100.00 |
| 13.20 | 71 | 71.0 | 7.86 | 92.14 | 90 - 100 |
| 9.50 | 141 | 212.0 | 23.48 | 76.52 | 70 - 88 |
| 4.75 | 145 | 357.0 | 39.53 | 60.47 | 53 - 71 |
| 2.360 | 125 | 482.0 | 53.38 | 46.62 | 42 - 58 |
| 1.180 | 95 | 577.0 | 63.90 | 36.10 | 34 - 48 |
| 0.600 | 66 | 643.0 | 71.21 | 28.79 | 26 - 38 |
| 0.300 | 62 | 705.0 | 78.07 | 21.93 | 18 - 28 |
| 0.150 | 55 | 760.0 | 84.16 | 15.84 | 12 - 20 |
| 0.075 | 62 | 822.0 | 91.03 | 8.97 | 4 - 10 |
| Pan | 81.0 | | | | |
| Total | 903.0 | | | | |

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4.The material used in the site satisfied the standard of MORTH's 5th revision and hence can be used in the work.

Asst. Executive Engineer
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## DETERMINATION OF RATE OF SPREAD TACK COAT

| | |
|---|---|
| Name of Work : | Improvements to widen portion of road,construction of New drains,UG cable duct and Footpath at Doddabommasandra main road surrounding road in Ward No.10 |
| Client : | BRUHAT BANGALORE MAHANAGARA PALIKE |
| Consultant : | TEJUS CONSULTANTS, BANGALORE |
| Contractor : | Sri. Gopikrishna Apsani ( Nidhi Constructions) |
| Date of Testing : | 17.03.2023 |
| Type of Mix : | Tack coat |
| Sample I/D : | 2 |
| Location : | Telecom Layout 4th Cross Road |

| Determination | Unit | Test No | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| Location | Chainage | #66 | #105 | #165 |
| Size of Plate (mxm) | Mt | 0.30 x .30 | 0.30 x .30 | 0.30 x .30 |
| Area of Plate (a) | Sq.mtr | 0.09 | 0.09 | 0.09 |
| Initial Wt of empty Plate (b) | Kg | 0.794 | 0.758 | 0.804 |
| Final weight of plate after application of tack Coat (c) | Kg | 0.817 | 0.781 | 0.827 |
| Weight of tack Coat (d=c-b) | Kg | 0.023 | 0.023 | 0.023 |
| Rate of spread of tack coat | Kg/sq.m | 0.252 | 0.252 | 0.252 |
| Average | Kg/sq.m | 0.252 | | |
| Specified Limit | Kg/sq.m | **0.250 Kg/sq.m** | | |

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4. The material used in the site satisfied the standard of MORTH's 5th revision and hence can be used in the work.

Consultants Representative

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## BITUMEN CONTENT AND GRADATION OF EXTRACTED AGGREGATE

| | |
|---|---|
| Name of Work | Providing Bangalore Mahanagara Palike |
| Client | TEJAS CONSULTANTS, BANGALORE. |
| Contractor | M/s. Gopalakrishna Aparna (Unit of Aparna Constructions) |
| Date of Casting | 17-01-2023 |
| Type of Mix | DBM |
| Sample No. | DBM-1 |

### DETERMINATION OF BITUMEN CONTENT

| Description | Trial 1 | Trial 2 |
|---|---|---|
| 1. Weight of Mixture before extraction, W1 | 1200 | 1200 |
| 2. Weight of Mixture after extraction, W2 | 1141 | 1144 |
| 3. Weight of Bitumen | 59 | 57 |
| 4. Weight of filter paper before extraction, W3 | 7.50 | 7.50 |
| 5. Weight of filter paper after extraction, W4 | 8.10 | 8.10 |
| 6. Weight of fines, W | 7.60 | 7.70 |
| 7. Weight of bitumen & fines | 67.10 | 67.10 |
| 8. Bitumen content in % | 4.91 | 4.92 |
| 9. Average bitumen content in % | 4.92 | |
| 10. Minimum bitumen content in % | 4.50 | |

### GRADATION OF AGGREGATE AFTER EXTRACTION

(As per MORTH Specification)

| | | | | | |
|---|---|---|---|---|---|
| Sample Location: | Telecom Layout 4th Cross Road | | Date of Sampling: | 07-01-2023 | |
| | | | Date of Testing: | 07-01-2023 | |
| Type of material & Purpose: | DBM | | Oven Dry Weight: | 1141 | |
| IS Sieve size in mm | Weight retained | Cummulative weight retained (gm) | Cummulative % of retained | Cummulative % of passing | Specification limits |
| | 0.0 | 0.0 | 0.00 | 100.00 | 100-100 |
| 37.50 | 0.0 | 0.0 | 0.00 | 100.00 | 100-100 |
| 26.50 | 0.0 | 0.0 | 0.00 | 100.00 | 90-100 |
| 19.00 | 342.0 | 342.0 | 29.97 | 70.03 | 71-95 |
| 13.20 | 376.0 | 718.0 | 62.93 | 37.07 | 56-80 |
| 4.750 | 95.0 | 813.0 | 71.25 | 28.75 | 38-54 |
| 2.360 | 152.0 | 965.0 | 84.58 | 15.42 | 28-42 |
| 0.300 | 87.0 | 1052.0 | 92.20 | 7.80 | 7-21 |
| 0.075 | 57.0 | 1109.0 | 97.19 | 2.81 | 2-8 |
| Pan | 32.0 | | | | |
| Total | | | | | |

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3. Any query regarding the report must be reported regarding within 10days from the date of testing.
4. The material used in the site satisfied the standard of MORTH & Spl. provisions and hence can be used in the work.

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Projects Division
Yelahanka Zone
BBMP, Bangalore - 92

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## DETERMINATION OF RATE OF SPREAD TACK COAT

| | |
|---|---|
| Name of Work : | Improvements to widen portion of roads remaining of New drains,UG cable duct and Footpath at Doddabommasandra main road surrounding road in Ward No.10 |
| Client : | BRUHAT BANGALORE MAHANAGARA PALIKE. |
| Consultant : | TEJUS CONSULTANTS, BANGALORE. |
| Contractor : | Sri. Gopikrishna Apsani ( Nidhi Constructions) |
| Date of Testing : | 18-03-2023 |
| Type of Mix : | Tack coat |
| Sample I/D : | 3 |
| Location : | Ganesh Nagar Road |

| Determination | Unit | Test No | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| Loacation | Chainage | @180 | @225 | @312 |
| Size of Plate (mxm) | Mt | 0.30 x .30 | 0.30 x .30 | 0.30 x .30 |
| Area of Plate (a) | Sq.mtr | 0.09 | 0.09 | 0.09 |
| Initial Wt of empty Plate (b) | Kg | 0.766 | 0.779 | 0.794 |
| Final weight of plate after application of tack Coat (c) | Kg | 0.789 | 0.802 | 0.817 |
| Weight of tack Coat (d=c-b) | Kg | 0.023 | 0.023 | 0.023 |
| Rate of spread of tack coat | Kg/sq.m | 0.252 | 0.254 | 0.254 |
| Average | Kg/sq.m | 0.254 | | |
| Specified Limit | Kg/sq.m | 0.250 Kg/sq.m | | |

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4.The material used in the site satisfied the standard of MORTH's 5th revision and hence can be used in the work.

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Project Division
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# BITUMEN CONTENT AND GRADATION DETERMINATION OF DENSE BITUMINOUS MACADAM MIX

| | | |
|---|---|---|
| Name of Work | : | Improvements to widen portion of roads,construction of New drains,UG cable duct and Footpath at Doddabevenasandra main road surrounding road in Ward No.10 |
| Name of Client | : | Bruhat Bengaluru Mahanagara Palike |
| Name of Consultant | : | TEJUS CONSULTANTS, BANGALORE |
| Name of Contractor | : | Sri. Gopikrishna Apsani ( Nidhi Constructions) |
| Date of Testing | : | 18-03-2023 |
| Type of Mix | : | DBM |
| Grade of BD | : | DBM-3 |

## DETERMINATION OF BITUMEN CONTENT

| Description | Trail 1 | Trail 2 |
|---|---|---|
| 1. Weight of Mixture Before extraction, g | 927 | 948 |
| 2. Weight of Mixture after extraction, g | 887 | 907 |
| 3. Weight of Bitumen | 40 | 41 |
| 4. Weight of filter paper Before extraction, g | 2.00 | 2.00 |
| 5. Weight of filter paper after extraction, g | 4.00 | 4.00 |
| 6. Weight of fines, g | 2.00 | 2.00 |
| 7. Weight of Bitumen & fines | 42.00 | 43.00 |
| 8. Bitumen content in % | 4.53 | 4.54 |
| 9. Average Bitumen content in % | 4.53 | |
| 10. Minimum Bitumen content in % | 4.50 | |

## GRADATION FOR DBM AFTER EXTRACTION

(As per MORT&H 500-10,Grading-2)

| | | | |
|---|---|---|---|
| Sample Locations: | Ganesh Nagar Road | Date of Sampling: | 18-03-2023 |
| | | Date of testing: | 18-03-2023 |
| Type of material & Purpose: | DBM | Oven Dry Wt.(gms): | 887 |

| IS Sieve size in mm | Weight retained | Cummulative weight retained (gm) | Cummulative % of retained | Cummulative % of passing | Specification limits |
|---|---|---|---|---|---|
| 37.50 | 0.0 | 0.0 | 0.00 | 100.00 | 100.00 |
| 26.50 | 53.0 | 53.0 | 5.98 | 94.02 | 90-100 |
| 19.00 | 142.0 | 195.0 | 21.98 | 78.02 | 71-95 |
| 13.20 | 153.0 | 348.0 | 39.23 | 60.77 | 56-80 |
| 4.750 | 182.0 | 530.0 | 59.75 | 40.25 | 38-54 |
| 2.360 | 85.0 | 615.0 | 69.33 | 30.67 | 28-42 |
| 0.300 | 124.0 | 739.0 | 83.31 | 16.69 | 7-21 |
| 0.075 | 93.0 | 832.0 | 93.80 | 6.20 | 2-8 |
| Pan | 52.0 | 884.0 | | | |
| Total | 887.0 | | | | |

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4. The material used in the site satisfied the standard of MORTH's 5th revision and hence can be used in the work.

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Consultant's Representative

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## FLAKINESS AND ELONGATION INDICES (IS 2386, PART I)

| | |
|---|---|
| Project : | Improvements to widen portion of roads,construction of New drains,UG cable duct and Footpath at Doddabommasandra main road surrounding road in Ward No.10 |
| Client : | BRUHAT BANGALORE MAHANAGARA PALIKE |
| Consultant : | TEJUS CONSULTANTS, BANGALORE |
| Contractor: | Sri. Gopikrishna Apsani ( Nidhi Constructions) |
| Type of Material | BC |
| Sample Location | At plant |
| Proposed Use | BC |
| Date of Sampling | 27-03-2023 |
| Date of Testing | 27-03-2023 |

| Size of aggregate | | Flakiness Index | | Elongation Index | |
|---|---|---|---|---|---|
| Passing through IS sieve, mm | Retained on IS sieve, mm | Total wt. of aggregate retained on sieves (A) gms. | Wt. of aggregate passing from Flakiness gauge (B) gms | Wt. of aggregate retained on Flakiness gauge (C) gms | Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms |
| 63.0 | 50.0 | 0 | 0 | 0 | 0 |
| 50.0 | 40.0 | 0 | 0 | 0 | 0 |
| 40.0 | 31.5 | 0 | 0 | 0 | 0 |
| 31.5 | 25.0 | 0 | 0 | 0 | 0 |
| 25.0 | 20.0 | 0 | 0 | 0 | 0 |
| 20.0 | 16.0 | 835 | 95 | 956 | 75 |
| 16.0 | 12.5 | 1485 | 182 | 1625 | 156 |
| 12.5 | 10.0 | 563 | 75 | 732 | 83 |
| 10.0 | 6.3 | 452 | 36 | 685 | 54 |
| Total | | 3335 | 388 | 3998 | 368 |

Note: Minimum 200 Pcs should be taken on each fraction of test

| | |
|---|---|
| Flakiness Index(%): | 11.63 |
| Elongation Index(%): | 9.20 |
| Combined FI+EL (%) | 20.84 |

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4.The material used in the site satisfied the standard of MORTH's 5th revision and hence can be used in the work.

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# DETERMINATION OF RATE OF SPREAD TACK COAT

| | |
|---|---|
| Name of Work : | Improvements to widen portion of roads,construction of New drains,UG cable duct and Footpath at Doddabommasandra main road surrounding road in Ward No.10 |
| Client : | BRUHAT BANGALORE MAHANAGARA PALIKE |
| Consultant : | TEJUS CONSULTANTS, BANGALORE |
| Contractor : | Sri. Gopikrishna Apsani ( Nidhi Constructions) |
| Date of Testing : | 28-03-2023 |
| Type of Mix : | Tack coat |
| Sample I/D : | 3 |
| Location | Ganesh Nagar Road |

| Determination | Unit | Test No | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| Location | Chainage | @89 | @188 | @304 |
| Size of Plate (mxm) | Mt | 0.30 x .30 | 0.30 x .30 | 0.30 x .30 |
| Area of Plate (a) | Sq.mtr | 0.09 | 0.09 | 0.09 |
| Initial Wt of empty Plate (b) | Kg | 0.845 | 0.789 | 0.815 |
| Final weight of plate after application of Tack Coat (c) | Kg | 0.868 | 0.812 | 0.838 |
| Weight of tack Coat (d=c-b) | Kg | 0.023 | 0.023 | 0.023 |
| Rate of spread of tack coat | Kg/sq.m | 0.253 | 0.254 | 0.253 |
| Average | Kg/sq.m | 0.254 | | |
| Specified Limit | Kg/sq.m | 0.250 Kg/sq.m | | |

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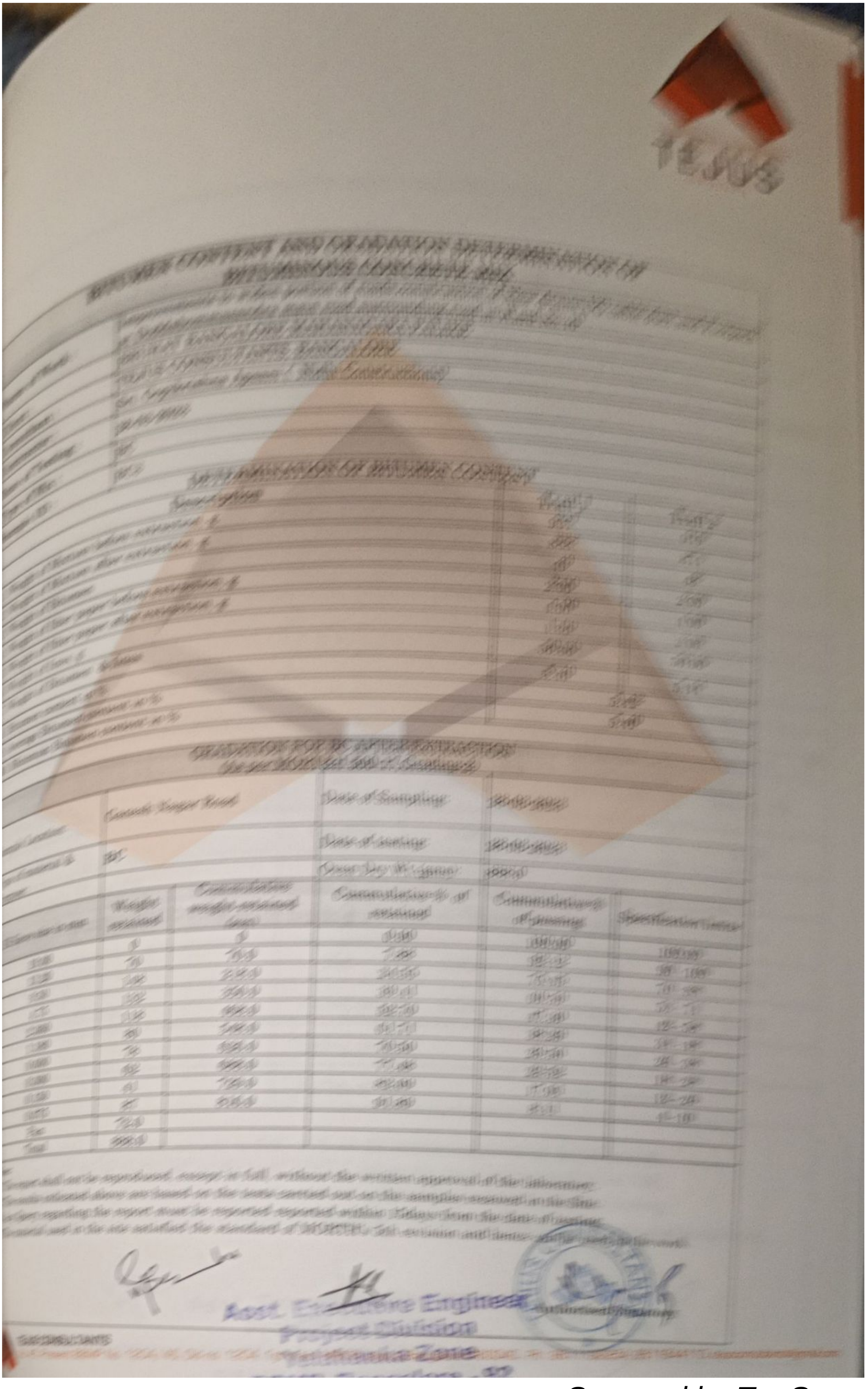

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## DETERMINATION OF RATE OF SPREAD TACK COAT

| | |
|---|---|
| Improvements to widen portion of roads,construction of New drains, UG cable duct and Footpath at Doddabommasandra main road surrounding road in ward No.19 | |
| BRUHAT BANGALORE MAHANAGARA PALIKE | |
| TEJUS CONSULTANTS, BANGALORE | |
| Sri. Gopikrishna Apsani ( Nidhi Constructions) | |
| 29-03-2023 | |
| Tack coat | |
| 5 | |
| 2nd Main Road Telicom Layout | |

| Description of Sample | Unit | Test No | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| Chainage | Chainage | @117 | @293 | @376 |
| Size (mm) | Mt | 0.30 x .30 | 0.30 x .30 | 0.30 x .30 |
| Area (a) | Sq.mtr | 0.09 | 0.09 | 0.09 |
| Tare weight- Plate (b) | Kg | 0.768 | 0.791 | 0.811 |
| Tare weight of plate with sample (c) | Kg | 0.791 | 0.814 | 0.834 |
| Net Mass (c-b) | Kg | 0.023 | 0.023 | 0.023 |
| Quantity of tack coat | Kg/sq.m | 0.251 | 0.252 | 0.252 |
| Average | Kg/sq.m | 0.252 | | |
| Limit | Kg/sq.m | 0.230 Kg/sq.m | | |

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# BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

| | |
|---|---|
| Name of Work : | Improvements to widen portion of roads,construction of New drains,UG cable duct and Footpath at Doddabommasandra main road surrounding road in Ward No.10 |
| Client : | BRUHAT BANGALORE MAHANAGARA PALIKE |
| Consultant : | TEJUS CONSULTANTS, BANGALORE |
| Contractor : | Sri. Gopikrishna Apsani ( Nidhi Constructions) |
| Date of Testing : | 29-03-2023 |
| Type of Mix : | BC |
| Sample I/D : | BC4 |

## DETERMINATION OF BITUMEN CONTENT

| Description | Trail 1 | Trail 2 |
|---|---|---|
| 1. Weight of Mixture before extraction, g | 927 | 905 |
| 2. Weight of Mixture after extraction, g | 878 | 858 |
| 3. Weight of Bitumen | 49 | 47 |
| 4. Weight of filter paper before extraction, g | 2.00 | 2.00 |
| 5. Weight of filter paper after extraction, g | 4.00 | 4.00 |
| 6. Weight of fines, g | 1.60 | 2.00 |
| 7. Weight of Bitumen & fines | 50.60 | 49.00 |
| 8. Bitumen content in % | 5.46 | 5.41 |
| 9. Average Bitumen content in % | 5.44 | |
| 10. Minimum Bitumen content in % | 5.40 | |

## GRADATION FOR BC AFTER EXTRACTION
(As per MORT&H 500-17,Grading-2)

| | | | |
|---|---|---|---|
| Sample Location: | Telicom Layout 4th Cross Road | Date of Sampling: | 29-03-2023 |
| Type of material & Purpose: | BC | Date of testing: | 29-03-2023 |
| | | Oven Dry Wt.(gms): | 878.0 |

| IS Sieve size in mm | Weight retained | Cummulative weight retained (gm) | Cummulative % of retained | Cummulative % of passing | Specification limits |
|---|---|---|---|---|---|
| 19.00 | 0 | 0 | 0.00 | 100.00 | 100.00 |
| 13.20 | 68 | 68.0 | 7.74 | 92.26 | 90 - 100 |
| 9.50 | 133 | 201.0 | 22.89 | 77.11 | 70 - 88 |
| 4.75 | 128 | 329.0 | 37.47 | 62.53 | 53 - 71 |
| 2.360 | 115 | 444.0 | 50.57 | 49.43 | 42 - 58 |
| 1.180 | 105 | 549.0 | 62.53 | 37.47 | 34 - 48 |
| 0.600 | 88 | 637.0 | 72.55 | 27.45 | 26 - 38 |
| 0.300 | 54 | 691.0 | 78.70 | 21.30 | 18 - 28 |
| 0.150 | 48 | 739.0 | 84.17 | 15.83 | 12 - 20 |
| 0.075 | 62 | 801.0 | 91.23 | 8.77 | 4 - 10 |
| Pan | 77.0 | | | | |
| Total | 878.0 | | | | |

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4.The material used in the site satisfied the standard of MORTH's 5th revision and hence can be used in the work.

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# BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

| | |
|---|---|
| Name of Work : | Improvements to widen portion of roads,construction of New drains,UG cable duct and Footpath at Doddabommasandra main road surrounding road in Ward No.10 |
| Client : | BRUHAT BANGALORE MAHANAGARA PALIKE |
| Consultant : | TEJUS CONSULTANTS, BANGALORE |
| Contractor : | Sri. Gopikrishna Apsani ( Nidhi Constructions) |
| Date of Testing : | 29-03-2023 |
| Type of Mix : | BC |
| Sample I/D : | BC5 |

## DETERMINATION OF BITUMEN CONTENT

| Description | Trail 1 | Trail 2 |
|---|---|---|
| 1. Weight of Mixture before extraction, g | 935 | 903 |
| 2. Weight of Mixture after extraction, g | 886 | 856 |
| 3. Weight of Bitumen | 49 | 47 |
| 4. Weight of filter paper before extraction, g | 2.00 | 2.00 |
| 5. Weight of filter paper after extraction, g | 4.00 | 4.00 |
| 6. Weight of fines, g | 1.60 | 2.00 |
| 7. Weight of Bitumen & fines | 50.60 | 49.00 |
| 8. Bitumen content in % | 5.41 | 5.43 |
| 9. Average Bitumen content in % | 5.42 | |
| 10. Minimum Bitumen content in % | 5.40 | |

## GRADATION FOR BC AFTER EXTRACTION
(As per MORT&H 500-17,Grading-2)

| | | | | |
|---|---|---|---|---|
| Sample Location: | 2nd Main Road Telicom Layout | Date of Sampling: | 29-03-2023 | |
| Type of material & Purpose: | BC | Date of testing: | 29-03-2023 | |
| | | Oven Dry Wt.(gms): | 886.0 | |

| IS Sieve size in mm | Weight retained | Cummulative weight retained (gm) | Cummulative % of retained | Cummulative % of passing | Specification limits |
|---|---|---|---|---|---|
| 19.00 | 0 | 0 | 0.00 | 100.00 | 100.00 |
| 13.20 | 75 | 75.0 | 8.47 | 91.53 | 90 - 100 |
| 9.50 | 113 | 188.0 | 21.22 | 78.78 | 70 - 88 |
| 4.75 | 130 | 318.0 | 35.89 | 64.11 | 53 - 71 |
| 2.360 | 113 | 431.0 | 48.65 | 51.35 | 42 - 58 |
| 1.180 | 101 | 532.0 | 60.05 | 39.95 | 34 - 48 |
| 0.600 | 78 | 610.0 | 68.85 | 31.15 | 26 - 38 |
| 0.300 | 82 | 692.0 | 78.10 | 21.90 | 18 - 28 |
| 0.150 | 66 | 758.0 | 85.55 | 14.45 | 12 - 20 |
| 0.075 | 70 | 828.0 | 93.45 | 6.55 | 4 - 10 |
| Pan | 58.0 | | | | |
| Total | 886.0 | | | | |

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## FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

| | |
|---|---|
| Project :: | Improvements to widen portion of roads,construction of New drains,UG cable duct and Footpath at Doddabommasandra main road surrounding road in Ward No.10 |
| Client :: | BRUHAT BANGALORE MAHANAGARA PALIKE |
| Consultant :: | TEJUS CONSULTANTS, BANGALORE |
| Contractor:: | Sri. Gopikrishna Apsani ( Nidhi Constructions) |
| Type of Material | BC |
| Sample Location | At plant |

| | |
|---|---|
| Proposed Use | BC |
| Date of Sampling | 10-04-2023 |
| Date of Testing | 10-04-2023 |

| Size of aggregate | | Flakiness Index | | Elongation Index | |
|---|---|---|---|---|---|
| Passing through IS sieve, mm | Retained on IS sieve, mm | Total wt. of aggregate retained on sieves (A) gms. | Wt. of aggregate passing from Flakiness gauge (B) gms | Wt. of aggregate retained on Flakiness gauge (C) gms | Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms |
| 63.0 | 50.0 | 0 | 0 | 0 | 0 |
| 50.0 | 40.0 | 0 | 0 | 0 | 0 |
| 40.0 | 31.5 | 0 | 0 | 0 | 0 |
| 31.5 | 25.0 | 0 | 0 | 0 | 0 |
| 25.0 | 20.0 | 0 | 0 | 0 | 0 |
| 20.0 | 16.0 | 792 | 78 | 943 | 75 |
| 16.0 | 12.5 | 1375 | 139 | 1226 | 113 |
| 12.5 | 10.0 | 508 | 48 | 469 | 64 |
| 10.0 | 6.3 | 475 | 55 | 448 | 73 |
| Total | | 3150 | 320 | 3086 | 327 |

Note: Minimum 200 Pcs should be taken on each fraction of test

| | |
|---|---|
| Flakiness Index(%): | 10.16 |
| Elongation Index(%): | 10.60 |
| Combined FI+EL (%) | 20.75 |

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4. The material used in the site satisfied the standard of MORTH's 5th revision and hence can be used in the work.

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# BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

| | |
|---|---|
| Name of Work : | Improvements to widen portion of roads,construction of New drains,UG cable duct and Footpath at Doddabommasandra main road surrounding road in Ward No.10 |
| Client : | BRUHAT BANGALORE MAHANAGARA PALIKE |
| Consultant : | TEJUS CONSULTANTS, BANGALORE |
| Contractor : | Sri. Gopikrishna Apsani ( Nidhi Constructions) |
| Date of Testing : | 12-04-2023 |
| Type of Mix : | BC |
| Sample I/D : | BC6 |

## DETERMINATION OF BITUMEN CONTENT

| Description | Trail 1 | Trail 2 |
|---|---|---|
| 1. Weight of Mixture before extraction, g | 897 | 919 |
| 2. Weight of Mixture after extraction, g | 850 | 871 |
| 3. Weight of Bitumen | 47 | 48 |
| 4. Weight of filter paper before extraction, g | 2.00 | 2.00 |
| 5. Weight of filter paper after extraction, g | 1.00 | 1.00 |
| 6. Weight of fines, g | 1.60 | 2.00 |
| 7. Weight of Bitumen & fines | 18.60 | 50.00 |
| 8. Bitumen content in % | 5.42 | 5.14 |
| 9. Average Bitumen content in % | 5.43 | |
| 10. Minimum Bitumen content in % | 5.40 | |

## GRADATION FOR BC AFTER EXTRACTION

(As per MORT&H 500-17,Grading-2)

| | | | |
|---|---|---|---|
| Sample Location: | Dhanlakshmi Enclave & 1st Main Road KVS Badavane | Date of Sampling: | 12-04-2023 |
| Type of material & Purpose: | BC | Date of testing: | 12-04-2023 |
| | | Oven Dry Wt.(gms): | 850.0 |

| IS Sieve size in mm | Weight retained | Cummulative weight retained (gm) | Cummulative % of retained | Cummulative % of passing | Specification limits |
|---|---|---|---|---|---|
| 19.00 | 0 | 0 | 0.00 | 100.00 | 100.00 |
| 13.20 | 68 | 68.0 | 8.00 | 92.00 | 90 - 100 |
| 9.50 | 112 | 180.0 | 21.18 | 78.82 | 70 - 88 |
| 4.75 | 120 | 300.0 | 35.29 | 64.71 | 53 - 71 |
| 2.360 | 113 | 413.0 | 48.59 | 51.41 | 42 - 58 |
| 1.180 | 95 | 508.0 | 59.76 | 40.24 | 34 - 48 |
| 0.600 | 78 | 586.0 | 68.94 | 31.06 | 26 - 38 |
| 0.300 | 71 | 657.0 | 77.29 | 22.71 | 18 - 28 |
| 0.150 | 62 | 719.0 | 84.59 | 15.41 | 12 - 20 |
| 0.075 | 66 | 785.0 | 92.35 | 7.65 | 4 - 10 |
| Pan | 65.0 | | | | |
| Total | 850.0 | | | | |

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4. The material used in the site satisfied the standard of MORTH's 5th revision and hence can be used in the work.

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